Posterior Subcapsular Cataracts In Patients Treated With Inhaled Steroids

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✔ Posterior subcapsular cataract formation as a risk of steroid therapy is generally assumed to be much lower with inhaled steroids than with systemic steroids. In this study, slit-lamp examinations were done on 14 adult asthmatic patients who were taking inhaled steroids (beclomethasone diproprionate) combined with intermittant short reducing courses of oral steroids. The mean age of the patients was 39.289±2.99 (SEM), the mean current daily dose of inhaled steroid was 1089.29±106.80 (SEM) µg and the mean duration of inhaled steroid therapy was 46.79±2.85 (SEM) months. The prevalence of posterior subcapsular cataracts was 7.14%.

Key words: Posterior subcapsular cataract, inhaled steroids, beclomethasone.

✔ Genel olarak, inhale steroid kullanan hastalarda, posterior subkapsüler katarakt gelişme riskinin sistemik steroid kullananlara göre daha az olduğu düşünülmektedir. Bu çalışmada, gerektiğinde kısa süreli oral steroid tedavisi de alan ve inhale steroid (beklometazon diproprinat) kullanmakta bulunan 14 erişkin astmatik hasta posterior subkapsüler katarakt gelişimi açısından incelendi. Hastaların yaş ortalaması 39.29±2.99 µM, günlük inhale steroid dozu ortalaması 1089.29±106.80 mg ve inhale steroid kullanım süresi ortalaması 46.79±2.85 ay idi. Posterior subkapsüler katarakt prevanlansı %7.14 olarak bulundu.

Anahtar Kelimeler: Posterior subkapsüler katarakt, inhale steroid, beklometazon.

Corticosteroids are widely used in the treatment of inflammatory diseases. Inhaled steroids are the most effective therapy currently available for astma, and they have become first-line therapy for chronic asthma[1,2]. Numerous studies have documented their long-term efficacy in asthma control in adults and children. Although the benefits of inhaled steroids in astma therapy are clear, there are concerns about systemic side effects of inhaled steroids[3].

Cataract formation as a complication of steroid therapy is typically of the posterior subcapsular type[4,5] The risk is generally assumed to bu much lower with inhaled steroids than with systemic steroids, although no systematically collected data are available to quantify the supposed advantage[1].

Initiating treatment at an increasingly early age and lenghty use of inhaled steroids in asthma have led us to concern about potential side effects. The aim of this study was to estimate the prevalence of posterior subcapsular cataracts as a complication of inhaled steroid therapy in astmatic patients.

MATERIALS AND METHODS

Fourteen patients receiving inhaled stero-id (beclomethasone diproprionate) for bron-chial astma were included in this preliminary, cross-sectional, retrospective study, None of them had a history of intraocular inflammatory disease and diabetes mellitus nor received radiation therapy.

All slit-lamp examinations were done

by the same opthalmologist (DE) who knew the patients had bronchial asthma for which inhaled steroid had been prescribed but had no specific knowledge of their medications, doses or duration of the treatment. After the measurement of intraocular pressures, the pupils were dilated with phenylephrine 10% drops and tropicamide 1% drops. Then both retroillumination and direct slit image views were obtained. Lens opacities, if present, were graded for severity with use of Lens Opacities Classification System II (LOCS II) which was developed by the Center for Clinical Cataract Research, Harvard Medical School, Boston, MA[6]. This system uses four nuclear standarts for grading nuclear opalescense and color, five cortical standarts and four subcapsular standarts. Because visual acuity and extend of lens abnormality are inconsistently related[6], visual acuity was not measured as a part of this study.

Drug usage data were collected by review of the clinical records of one physician (LE) directly responsible for the long-term care of the patients. Details of oral and inhaled steroid usage derived from these records are listed in Table I. Inhaled steroid usage was quantified in terms of the current daily dose, duration of therapy and cumulative dose. Oral steroid usage was quantified in terms of the cumulative prednisolone dose with the number of intermittant short reducing courses (X No.) We also recorded the time since prednisolone was last taken. None of the patients had additional intranasal steroid formulations for treatment of allergic rhinitis and topical steroids for treatment of allergic conjunctivitis or atopic dermatitis.

RESULTS

Details of patients and steroid usage are shown in Talbe I and II. The mean age of the patients was 39.29±2.99 (SEM). Eight (57.14%) patients were female and 6 (42.86%), male. The mean duration of asthma was 9.00±0.80 (SEM) years. All patients used inhaled steroid regularly at the time ocular examination was performed. Current daily dose of inhaled beclomethasone was 750 µg in 3 (21.42%), 1000 µg in 9 (64.29%) and 2000 µg in 2 (14.29%) patints. The group mean duration of inhaled steroid therapy was 46.79±2.85 (SEM) months with a mean current daily dose of 1089.29±106.80 (SEM) µg. The mean cumulative dose of inhaled steroid therapy was 1398.75±151.65 (SEM) mg.

Twelve (87.71%) patients received intermittant short reducing courses (10 to 20 days) of oral prednisolone in the past. The mean cumulative dose of oral prednisolone among these patients was 1645.42±594.08 (SEM) mg. Five (41.67%) patients used one course, 4 (33.33%) used two, 2 (16.67%) used three and one (8.33%) used nine courses of oral prednisolone in the past. The mean time since last oral prednisolone therapy was 33.71±5.11 (SEM) months. Thirteen (92.86%) patients included in this study had not used oral steroid in the year preceding slit-lamp examination.

The mean intraocular pressures were 15.64±0.46 (SEM) mmHg in the right eye and 15.57±0.51 (SEM) mmHg in the left.

The prevalence of lens oparicities in this patient group is shown in Table III. Three (21.43%) of the 14 patients had some type of lens opacity (Table I). One patient (No:13) had posterior subcapsular cataract; 3 had non-posterior subcapsular lesions; the patient with posterior subcapsular cataract had non-posterior lesions also. The prevalence of posterior subcapsular cataracts was 7.14%.

Table-I: Details of Patients

No	Age (yr)	Oral Steroid Cumulative dose (x No) (mg)	Oral Steroid Time since last taken (months)	Inhaled Steroid Current daily dose (μg)	Inhaled Steroid Cumulative dose (mg)	Duration of therapy (monts)	Catarats Grade # R	Catarats Grade # L
1	26	-	-	750	810	36	0	0
2	27	700 (X1)	48	1000	1230	39	0	0
3	30	435 (X1)	48	1000	1440	48	0	0
4	31	700 (X1)	12	2000	3060	64	0	0
5	34	-	-	1000	1800	60	0	0
6	34	1200 (X2)	18	1000	1380	46	0	0
7	36	860 (X2)	30	1000	900	36	0	0
8	38	1320 (X2)	12	750	832.5	37	0	0
9	40	760 (X2)	63	1000	1740	58	0	0
10	42	700 (X1)	38	1000	1140	38	0	0
11	43	700 (X1)	64	1000	1500	50	0	0
12	46	2120 (X3)	43	750	1440	64	NI	NI
13	58	7900 (X9)	4	1000	1200	40	NI,PI	NI,PI
14	65	2350 (X3)	25	2000	1110	39	CII	CII

X No : Number of courses
\# : Graded by the LOCS II classification system (6).
R : Right eye,
L : Left eye.

Table-II : Inhaled and Oral Steroid Usage

	Mean (SEM)	Range
Inhaled Steroid (n = 14)		
Current daily dose (μg)	1089.29 (106.80)	750-2000
Cumulative dose (mg)	1398.75 (151.65)	810-3060
Duration of therapy (months)	46.79 (2.85)	36-64
Oral Steroid (n = 12)		
Cumulative dose (mg)	1645.42 (594.08)	435-7900
Time since last taken (months)	33.75 (5.11)	4-64

Table-III: Prevalance of Catarats*

Non-posterior subcapsular lens opacities			Posterior subcapsular lens opacities		
Grade #	n	% of Group	Grade #	n	% of Group
0	11	78.57	0	13	92.86
Trace	0	0			
I	2	14.29	I	1	7.14
II	1	7.14	II	0	0
III	0	0	III	0	0
IV	0	0	IV	0	0
V	0	0			

One patient had posterior subcapsular and non-posterior subcapsular opacities.
*n = 14
= Graded by the LOCS II classification system (6).

DISCUSSION

Systemic steroids have an extensive list of side effects which are mainly observed when the oral or parentral dose exceeds 10 mg of prednisolone or an equivalent dose of another steroid; taken daily for several weeks or months[7]. Posterior subcapsular cataracts have been described in patients with asthma who received substantial dose of oral steroids. In a recent review posterior subcapsular cataracts were identified in 9% of patients with asthma, 18% with rheumatoid arthritis, and over 40% either with systemic lupus eryhematosus or after renal transplantation[8] This lower prevalence in asthmatic patients was thought to be due to a lower cumulative dose of steroids, their younger ages and the usage of intermittant short reducing courses.

Numerous clinical studies have demonstrated that the use of inhaled steroids in asthma usually results in adequate antiasthmatic effect and side effects is much better for inhaled than oral steroids[7]. The systemic effect of an inhaled steroid will depend on several factors; including the dose, the delivery system used, the site of deposition of the drug (gastrointestinal tract and lung) and the individual differences in steroid response between different patients[1,2].

There are a few reports of poterior subcapsular cataracts in patients taking inhaled steroids[9,10], but in many cases past or current oral steroid therapy confounds the interpretation of causative role attributed to the inhaled steroids.

In the most comprehensive study to date in which the author investigated the association between the occurence of posterior subcapsular cataracts and inhaled and oral steroid therapy in 48 adults for whom accurate records of the long-term steroid usage were available (9.2 years for inhaled steroids, 9.1 years for prednisolone), the poste-

rior subcapsular cataract prevalence was 27%[11]. This high prevalence of posterior subcapsular cataracts was correlated with both the daily dose and the duration of oral steroid therapy, but not with the dose and duration of inhaled steroid therapy. The mean inhaled steroid dose was 1460 µg per day. In a cross-sectional study of children taking inhaled beclomethasone or budesonide, no cataracts were found on slit-lamp examinations, even in patients who had taken 2000 µg per day for more than 10 years[12]. Preexisting posterior subcapsular cataract has been reported to resolve within 6 months, after converting from regular prednisolone to inhaled steroid therapy, in a few children with astma[13].

The prevalence of posterior subcapsular cataracts was 7.14% in our study. Only one of our 14 adult patients had posterior subcapsular cataract (Grade PI: Cataract filling approximately 3% of the area of the posterior capsule); she was one of our oldest patients (58 years old) and, she, not only had the highest cumulative oral steroid dose (7900 mg), but also was the only patient who received oral steroid in the year preceding the slit-lamp examination. We think that, this low grade posterior subcapsular cataract in this patient may be attributed to previous oral steroid use rather than the inhaled steroid therapy.

The patients in this study differ from the adult patients reported in previous studies in that they had never received long-term oral steroid therapy, additional intranasal steroid formulatinos or topical steroid. They used inhaled steroids (750-2000 µg per day) combined with intermittant short reducing courses of oral steroids. The mean current daily dose of inhaled steroid was 1089.29±106.80 SEM) µg and the mean duration of inhaled steroid therapy was 46.79±2.85 (SEM) months.

Although inhaled steroid therapy does not seem to be a risk factor for posterior subcapsular cataract formation in this study, further long-term follow-up studies including more patients are needed to confirm this.

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